



Docket No.: M4065.0067/P067
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#9/BF
7/12/01
Jules

In re Patent Application of:
Warren M. Farnworth

Application No.: 09/118,080

Group Art Unit: 2814

Filed: July 17, 1998

Examiner: A. Chambliss

For: LEAD OVER CHIP SEMICONDUCTOR
DEVICES WITH A BALL GRID ARRAY

AMENDMENT AFTER FINAL REJECTION

Commissioner for Patents
Washington, DC 20231

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Dear Sir:

In response to the Office Action dated March 29, 2001 (Paper No. 7), please amend the above-identified U.S. Patent application as follows:

IN THE CLAIMS:

Rewrite claim 1 as follows:

1. (Twice Amended) A semiconductor device, comprising:
a semiconductor chip;
a single dielectric layer;
electrically conductive leads on said dielectric layer; and

B1
sub
C1

*cancel
B1
C1 and*

a low temperature curing adhesive material that cures without exceeding one hundred fifty degrees Fahrenheit, said low temperature curing adhesive material being located between said semiconductor chip and said dielectric layer.

Cancel claim 8, without prejudice.

Rewrite claims 10 and 13 as follows:

*B2
sub
C2*

10. (Twice Amended) A taped semiconductor product, comprising:
integrated circuits formed in semiconductor material;
a tape having openings aligned with said integrated circuits, wherein said tape includes a single dielectric layer and electrically conductive leads, said leads being printed on said single dielectric layer;
bond wires extending through said openings, said bond wires being electrically connected to said integrated circuits; and
adhesive material between said tape and said integrated circuits, wherein said adhesive material cures at room temperature.

*B3
sub
C3*

13. (Twice Amended) A tape for manufacturing semiconductor devices, said tape comprising:
a single dielectric layer having openings;
electrically conductive leads associated with said openings, said leads being printed on said dielectric layer; and
a low temperature curing adhesive material that cures without exceeding one hundred fifty degrees Fahrenheit, said low temperature curing adhesive material being located between said semiconductor chip and said dielectric layer.

REMARKS

Claims 1 and 13 have been amended. Claim 8 has been canceled. Claim 10 has been rewritten in independent form. Claims 1-7 and 10-33 remain in the application. Claims 19-30 are withdrawn from consideration. Applicant reserves the right to pursue the original claims and other claims in this application and in other applications.

Claims 1-7 and 10-18 are rejected under 35 U.S.C. § 103 as being unpatentable over Heo in view of Khandros. Reconsideration is respectfully requested. Claim 1, as amended, relates to a semiconductor device that has, among other things, an adhesive material located between a semiconductor chip and a dielectric layer. As recited in claim 1, as amended, the adhesive material cures “without exceeding one hundred fifty degrees Fahrenheit.” This is an important feature of the claimed invention. As explained, for example, in page 10 of Applicant’s specification, the low temperature adhesive material can avoid misalignment problems that could otherwise be caused by differential thermal expansion. Heo fails to disclose or suggest the adhesive material of amended claim 1. Khandros is cited for another feature. Accordingly, the rejection of claim 1 should be withdrawn. Claims 2-7 depend from claim 1 and should be allowable along with claim 1 and for other reasons.

Claim 10 relates to a taped semiconductor product with adhesive material between the tape and the integrated circuits, where the adhesive material cures at room temperature. Neither Heo nor Khandros teach or suggest this important aspect of the claimed invention. Accordingly, claim 10, and dependent claims 11 and 12, should be considered allowable. The Office Action argues that “Heo discloses an epoxy adhesive material 21 [sic, 30] that would cure at room temperature based on the epoxy adhesive composition” (Office Action, page 4, lines 6-8). Applicant respectfully submits, however, that the Office Action reads too much into Heo. Heo actually does not provide the teaching attributed to it by the Office Action. Heo nowhere teaches or suggests that the adhesive means 30 (or the non-conductive film 21) cures at room temperature. Heo just

says that that the adhesive means 30 “comprises an epoxy adhesive or an adhesive film” (column 5, lines 18-20), and, contrary to the Office Action, Heo does not teach the composition of the epoxy adhesive.

Claims 13-18, as amended, similarly to amended claim 1, each recite “adhesive material that cures without exceeding one hundred fifty degrees Fahrenheit.” Heo and Khandros, even when considered in combination, fail to disclose or suggest this important feature of the claimed invention. The rejection of claims 13-18 should be withdrawn.

Claims 31-33 are rejected under 35 U.S.C. § 103 as being unpatentable over Heo in view of Khandros and Tsukagoshi. Reconsideration is respectfully requested. There is no reason provided or suggested by the references, and the Office Action provides no explanation, as to why the anisotropically conductive adhesive taught by Tsukagoshi should be used in place of the adhesive means 30 of Heo. The conductivity of the Tsukagoshi material would serve no purpose in the Heo product. The rejection of claims 31-33 amounts to nothing more than an improper hindsight attempt to reconstruct the claimed invention by picking and choosing isolated features from prior art references without any reason suggested for combining the features together. The rejection of claims 31-33 should be withdrawn. Allowance of the application is solicited.

The Examiner’s attention is also directed to Divisional Application No. 09/620,991 (assigned to Examiner A. Chambliss) and the references of record therein.

Dated: June 30, 2001

Respectfully submitted,

By 

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